

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of:

RE: DELETE, DELETE, DELETE
GN Docket No. 25-133

Comments of Steven K. Stroh

The Commission provides five radio services available for the use of individuals for personal communications via radio between individuals and groups:

Amateur Radio Service (ARS)

Citizens Band Radio Service (CB)

Family Radio Service (FRS)

General Mobile Radio Service (GMRS)

Multiple Use Radio Service (MURS)

In relation to Amateur Radio Service, as an Amateur Radio Operator (Callsign N8GNJ) I have submitted separate comments with recommendations. Thus I won't address the Amateur Radio Service in the following comments.

For CB, FRS, GMRS, and MURS I offer the following comments and recommendations.

CB, FRS, GMRS, and MURS are intended for radio transmission of voice using analog modulation methods. While they are all highly useful, especially in emergency situations, their utility, capability, and capacity could be vastly improved if two changes are implemented relating to GN Docket No. 25-133:

- 1. Delete restrictions on the use of data from CB, FRS, GMRS, and MURS.**
- 2. Delete the specification of (analog) modulation methods from CB, FRS, GMRS, and MURS.**

Regarding 1, our 21st century society is now a "data communications" society. We take for granted the worldwide reach and capabilities of the Internet, and the ability to conduct text conversations with our mobile phones with anyone, anywhere, at any time.

Some of these services such as FRS and MURS currently permit very limited use of data. But the transmission of *data* in addition to voice via radio would make all four of

these services much more useful to society if data were permitted, with few or no limitations.

This is especially true when considering that these services would be far more usable in emergencies if data transmission could be allowed. For example, being able to transmit text messages from one's mobile phone to a neighborhood chat group via Family Radio Service or GMRS.

One example of the potential utility of data for individuals using CB, FRS, GMRS, and MURS is the transmission of position (GPS) data using the LoRa modulation system in the unlicensed 902-928 MHz band. LoRa modulation allows low-powered signals to reach much further. This technique has been used in off-road races and large events such as Burning Man. The ability to do the same in lower frequencies such where CB, FRS, GMRS, and MURS operate would enhance such capabilities.

Another example, which also uses LoRa modulation system in the unlicensed 902-928 MHz is Meshtastic - <https://meshtastic.org/>. Meshtastic is a text messaging system that also incorporates automatic discovery mesh networking. Meshtastic networks can automatically relay messages throughout a mesh without the need of centralized infrastructure - ideal for emergency situations where infrastructure such as mobile telephone networks and Internet has been disabled.

A final example is Ribbit - <https://www.ribbitradio.org/#/>. Ribbit is software (smart phone app) that allows data communications over any "Push to Talk" (PTT) device such as CB, FRS, GMRS, and MURS (and PMR 446 in Europe, equivalent to FRS). There is no physical connection between a PTT device and the smartphone. The two devices are placed close to each other, and when the Ribbit app is in operation, it listens for Ribbit transmissions with the smartphone's microphone and decodes anything heard onto the display screen of the smartphone. When transmitting, the user pushes the PTT button on the radio, and taps the Transmit button on the Ribbit app and the smartphone's speaker emits the data burst which is heard by the radio's microphone.

The emergence of Ribbit as software that can make use of any PTT device demonstrates that there is demand and need for data capability over services such as CB, FRS, GMRS, and MURS.

Regarding 2, a significant limitation of CB, FRS, GMRS, and MURS is the limited spectrum available and resulting limited number of users that each system can accommodate. The Commission recently enabled FM modulation within CB, and while that change will make CB more usable (more listenable, more robust than AM or SSB modulation), allowing FM modulation that didn't provide more capacity for more users.

Digital modulation for voice enables an increase in capacity and usability compared to analog modulation methods. In addition to adding capacity to accommodate more simultaneous use (compared to analog methods), digital modulation is inherently data... that is "hard coded" for transmission of voice. Thus the use of digital modulation de facto enables the use of data communications; not just digital voice *or* data, but voice

and data can be interleaved for simultaneous voice / data use. For example, the (data) transmission of a person's name for display in addition to transmitting their voice.

For the CB, FRS, GMRS, and MURS services to be "digital enabled", it is not necessary for the Commission to specify specific digital modulation systems. Industry coordination could quickly settle on common suitable systems for use in these services. As newer, more capable systems emerge, if the newer systems prove to be more robust and capable, users will purchase them and use them, and these services will "evolve" with technology improvements and user requirements.

Note that the use of "digital" modulation methods does not equate to "encryption". If the Commission does not wish to allow encryption in CB, FRS, GMRS, and MURS, in enabling the use of digital modulation and data communications, it can specify that all digital modulation and data communications methods used in CB, FRS, GMRS, and MURS be publicly disclosed in a manner specified by the Commission.

Conclusion

The ability of individuals to communicate via radio systems that are independent of infrastructure, especially in emergency situations, would be considerably enhanced if the Commission would enable the use of digital systems (delete the specification of analog modulation methods), and especially the removal of prohibitions on the use of data communications in these services.

I thank the Commission for this rare opportunity to comment on the regulations governing CB, FRS, GMRS, and MURS and the chance to suggest meaningful changes that would benefit individuals and users of those services.

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